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REMARKS

Claims 1-5 and 7-16 pending herein. Claim 1 has been amended to clarify certain features, claim 12 has been rewritten to be in independent form, and new claim 16 has been added hereby.

1. The finality of the restriction requirement is acknowledged. In addition, claim 15 has been amended herein to correspond to the elected invention.

2. Claims 1-14 were rejected under §112, second paragraph. The present claims have been amended to clarify the "zone" recited in the claims. In addition, the minor issues relating to the dependent claims have also been addressed. Accordingly, withdrawal of the §112, second paragraph rejection is respectfully requested.

3. Claim 12 was rejected under 112, first paragraph. This rejection is respectfully traversed for the following reasons.

Claim 12 recites particular geometrical features of the showerhead, particularly, having a width at least as wide as the sum of the widths of the translating tapes, plus the sum of the distances therebetween, and having a length at least as great as the width. It is well established that the claims as-filed constitute a part of the original written description of a patent application. Accordingly, clearly the original disclosure, claim 12 constituting a part thereof, describes a showerhead having a width and length as recited. It appears that the PTO has taken a position that because the geometrical features of claim 12 are not described in the specification and not depicted in FIG. 2, and that the original written description does not enable one of ordinary skill in the art to make and/or use the invention as recited in claim 12. However, Applicant respectfully disagrees. Clearly, one of ordinary skill in the art understands how to construct the showerhead and implement its use as recited in claim 12 based upon the text of claim 12. That is, the original language of claim 12 as read by one of ordinary skill in the art provides a fully enabling disclosure with respect to the geometric features of the showerhead, particularly read in the context of the specification and Fig. 2. To address any written description issues, the subject matter of claim 12 has been placed into the present specification, paragraph 26, last sentence. In

light of the forgoing comments, reconsideration and withdrawal of the 112, first paragraph rejection are respectfully requested.

4. Claims 1-6 and 8-13 were rejected under §103 over Wiesmann et al. in combination with either deBarbadillo, II et al. or Yoshida, in further combination with Lee et al. This rejection is respectfully traversed for the following reasons.

The claimed invention is drawn to a dynamic process, in which long length layered superconductors are provided by translating a tape through a precursor conversion zone of a process chamber, the tape comprising a buffered metal substrate tape having precursors of $\text{ReBa}_2\text{Cu}_3\text{O}_7$ deposited thereon. According to the claimed invention, during translation through the precursor conversion zone, oxygen and water vapor are introduced through a showerhead into the precursor conversion zone. Further, the translating tape is heated and pressure is maintained so as to be between 1 torr and 760 torr. According to the claimed process, the precursors are converted into a superconducting coating.

Applicant particularly draws the attention of the PTO to the claimed introducing step, where oxygen and water vapor are introduced *through a showerhead* into the precursor conversion zone while translating the tape. Introduction of oxygen and water vapor through the showerhead while translating the tape is of notable importance to the claimed invention, contributing to a marked improvement in crystallographic features of the converted superconducting coating. In particular, Applicant has discovered that in the context of a dynamic process in which a tape is translated through a conversion zone, it is quite difficult to maintain uniform distribution of water vapor. Accordingly, Applicant has incorporated a showerhead into the claimed process flow for distribution of oxygen and water vapor, and has found that its use improves the crystallographic texture of the converted superconducting coating, and accordingly, provides improved superconducting properties of the coating.

Turning to the cited prior art, it appears that the PTO has relied upon the primary reference Wiesmann et al. for disclosure of a ex-situ process flow in which a coated substrate is subjected to water vapor and oxygen to convert the coating to a superconducting material. Since the disclosed process is static, and does not incorporate translation of a coated substrate through a conversion zone, the PTO has looked to secondary references Yoshida or deBarbadillo, II et al.

The PTO has acknowledged that even as modified, the combination of Wiesmann et al. and Yoshida or deBarbadillo, II et al. does not disclose or suggest use of a showerhead through which oxygen and water vapor are introduced. In fact, deBarbadillo, II et al. disclose use of conduits 25 and 27 through which oxygen is fed for superconductor conversion, not a showerhead. In an attempt to cure the deficiencies of Wiesmann et al., Yoshida and deBarbadillo, II et al., the PTO has looked to Lee et al.

Lee et al. disclose a chemical vapor deposition (CVD) chamber which is generally used for semiconductor fabrication, particularly, coating semiconductor or silicon wafers with a chemical vapor deposited coating. While generally related to the semiconductor arts, Applicant acknowledges that Lee et al. make a background reference to metalorganic chemical vapor deposition (MOCVD) for forming superconductive thin films. The processing chamber of Lee et al. utilizes a showerhead arrangement for introduction of reactive gases for forming the target composition on the substrate. That is, a plurality of source gases are passed through the showerhead, the gases reacting to form a depositing material on the substrate.

Foremost, Applicant respectfully submits that absent Applicant's own disclosure, one of ordinary skill in the art would not have incorporated the showerhead of Lee et al. into the modified Wiesmann/Yoshida/deBarbadillo apparatus. While it is quite well known and commonplace to utilize showerheads in the context of MOCVD deposition, the art nowhere teaches or suggests use of a showerhead in a *conversion* process. In this respect, Applicant emphasizes that Lee et al. teach introduction of forming gases, not conversion gases, through a showerhead.

Furthermore, as stated above, Applicant has discovered that utilization of a showerhead in the context of the claimed dynamic conversion process, addresses notable challenges in the context of a dynamic, continuously translating tape. Particularly, incorporation of a showerhead for flow of conversion gases in the claimed dynamic process improves crystallographic texture of the converted film and consequent superconducting properties. The art of record nowhere discloses or even remotely suggests such advantages, and such advantages are indicative of the non-obviousness of the claimed invention. It is also emphasized that it was Applicant's discovery, not that of the prior art, of degradation and superconducting properties when

converting from a static conversion process to a dynamic conversion process, which lead to development of the claimed invention.

For at least the foregoing reasons, Applicant respectfully submits that the presently claimed invention would not have been obvious over the cited prior art. Accordingly, reconsideration and withdrawal of the §103 rejection are respectfully requested.

4. Claims 7 and 14 were rejected with the reliance upon additional secondary references. However, the additional references do not cure the deficiencies of the Wiesmann/Yoshida/deBarbadillo/Lee combination as discussed above in detail. Accordingly, withdrawal of these §103 rejections is respectfully requested as well.


Applicant respectfully submits that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicant would be desirable for placing this application in even better condition for issue, the Examiner is requested to contact Applicant's undersigned attorney at the number listed below.

The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

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